No. 16 November $2

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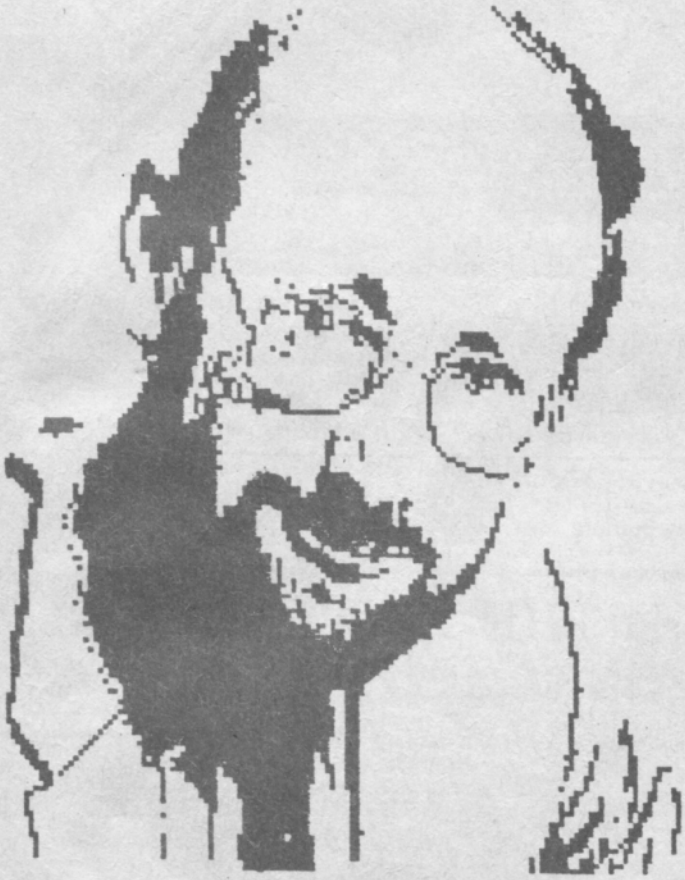

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TS 2068

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Nov. 1985 **TS HORIZONS** No. 16

ENTER 4
News from the World of Sinclair 6
Try These 7
Alpha Strings-Reader Input
In Sync-2068 Line Renumbering Routine -by John Bell 10
Clover-A 2068 Graphics Program by Bernard Bush 11
The Stopper- for the TS 1000 by Walt Coleman 12
Quick Balance-by Bob Woish 13
Logic Families-by Paul Hunter 14
Notes on Bank Switching Series by Paul Hunter 15
More Notes on Vu-Calc (TS1000) by Charles Peterson 18
MTerm and Spectrum by David Hosher 20
Reviews by Tex 21
"BIZ" and "Draw II" for the 2068
"Partial Pascal" for the TS1000
Two Interfacing Books 24
For all Sinclair Computers
Reviewed by P. Donnelly
Reviews for the Non Programmer 27
ChromaSoft, etc.
QL Report from Curry Computer 28
TS News 30

BACK ISSUES

#1 Nov'83 Creating/Saving Files (Johnson), Repeat Key and Uninterruptible Power Supply Projects, Numerical Analysis, Load/Save Problems, Reviews, and more!

#2 Dec'83 Matrix/Cursor Input (Johnson), User-Friendliness, Reset Switch Project, Memory Reduction, Rule of 78, IX Cash Register, Graphics Tutorial,etc!

#3 Jan/Feb'84 Two Animation Programs, Simple Loading Aid Proj. (Young), Tape File Protection, Differential Equations,Ham Radio Reviews, User Group News & More!

#4 March '84 The Death of TCC, TS1000 Bank Switching (Hunter), Error Recovery (Johnson), Edge Connector Schem., Simpson Rule, Reviews, Reader Input, & more!

#5 April/May'84 "WORM" Word Processor(Young) Pt.1, Least Squares, TS1000 Graphics Program, TS2068 Future?, Bank Switching Pt. 2, Program Tips, Reviews, and more!

#6 June'84 Ts1000 As Church Aid, Interfacing Books, Num. Analysis, Hardware Tips, "WORM"-2, Switching-3, Good News from EA Brown, Six Reviews, and more!

#7 July/Aug'84,Telecommunications Issue, 2068 Program Tips, How A Compiler Works, Rotating Globe, Byte-Back Modem, TC for Beginner, Switching-4, WORM-3, S.I.N., etc.

#8 Sept'84 TS 1000 Music Program, 2068 Plotter, 2068 Character Set (Young), Address Program, Nine Reviews, Telecommunications Column, TS News, and more!

#9 Oct/Nov '84 - ANNIVERSARY ISSUE, TS 2068 Spirograph, Dave Higgenbottom interview, FORTH for T/S Computers, Spectrum section, Bank Switching-5, Telecommunications, Reviews, etc.

#10 Dec '84 - 40 PAGES, Making Backups of 2068 Software, Banner Programs, QL, TS1000 Program Tips,Christmas program, RS100vs.TS1000,MTermII,Horizon Awards, Switching-6, TSUGs, New Column, more!

#11 Jan'85-40 Pages, Lower Case on the TS 1000, 2068 Word Processor Eval.-Pt.1, Bar Graph, Experimenting with Byte Back Modem, Bank Switching-7, INDEX of issues 1 to 10, Reviews, and more.

#12 Feb/Mar 85 - 2068 Mass Storage, Software from England, Program Tips for TS1000, 2068 W.P. Eval.-Pt.2, Bank Switching Concluded, MTERM Patches, 2068 Tutorial, Programs.

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ENTER

Dear Readers,

If you haven't heard by now Sinclair has announced a major price reduction for the QL. It is now available at under $300 from most of the companies who have been bringing you Timex/Sinclair related products in the past. Sinclair's suggested price is now $299.

In this month's and last month's QL Report, Rob Curry has made a strong argument to support his contention that compared to Commodore's Amiga and Atari ST,the QL is at least as good a computer. When you consider the software and peripherals already available for the QL (which has,of course, has been sold in England for over a year now) and the great software package of four high-quality programs that comes free with every QL, the QL is clearly the best buy. Now with the price reduction there is no comparison.

So now it won't be long till the QL takes America by storm, right? That remains to be seen. Have you turned on your TV lately? Commodore is pumping serious bucks in advertising Amiga in all the big football games and popular prime time shows. It may be that advertising dollars and name-recognition will be the deciding factors in this race.

For some reason that doesn't bother me a whole lot. After all, we Sinclairites have always been a rather exclusive group, at least in North America. (In Europe Sinclair is the most common brand of home computer.) Sure everybody and his brother bought a TS1000 when they first came out, but how many people had the temerity to stick it out. Just <u>us</u>,right?

Speaking of the good old days of ZX81s and SYNC magazine- when I first decided to buy a Sinclair ZX81, I believe the price was up around $300 for the computer and 16K Ram. (Of course by the time I convinced my wife to let me have one the price had dropped considerably). Now you can get the QL, an advanced computer for nearly the same price. That's Sinclair technology for you.

128K Spectrum

We hear that Commodore is preparing to drop the Commodore 64 and switch completely to the 128 K version. Apparently Sinclair has a similar idea in mind for the Spectrum.

According to rumor the 128K Spectrum has been available in Spain and will be introduced in England in late 1986. Sinclair is picking up on some Timex's innovations for the 2068-including two display modes, a joystick port, a sound chip, a bank switching of memory in 64K chunks.

<u>SPECIAL ANNOUNCEMENT</u>: MIDWEST TIMEX SINCLAIR COMPUTER FEST

Just as we were going to press Jack Roberts of the TS Connection in Cincinnati and the Cincinnati Timex User Group called. He has been in touch with a Mr. Frank Favis from Indiana. Mr. Favis has been doing some preliminery work on the idea of a Midwest TS Computer Fair. I was invited to a meeting later this month in Cincinnati to consider the idea some more. At this point they have decided on early Spring '86 as the time and Cincinnati as the likely location.

That's all I know for now, but as details are confirmed TS Horizons will keep all of you informed. Given our close proximity to Cincinnati we hope to be a big part of the fair if it indeed comes to pass. TSH

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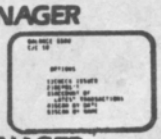

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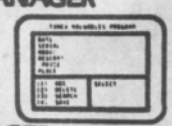

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For coupon clippers, the T/S 1000 can keep track of those coupons showing what they are for, where they are offered, and starting and ending dates. You can list them by store or type and bring the computer age into your household, saving time and effort. © TIMEX 1982

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Navigate your way through a three-dimensional maze, complete with trapdoors, gold bars, marker stones, and a compass. Ten separate mazes, with up to four options each. Extremely challenging and a fine use of three-dimensional graphics. © Greg Harvey 1982 Softsync, Inc.

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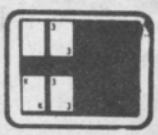

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News from the WORLD OF SINCLAIR

SINCLAIR INVADES EGYPTIAN HIGH SCHOOLS
Submitted by subscriber Faisal El-Shoufy

Egyptian high schools have begun to use the ZX Spectrum computers in its classes nationwide.

It all began when Egyptian scientists living in the USA recognized the importance of using computers in Egyptian schools in order to give the new generation a chance to benefit from modern technology. So, the Egyptian scientific society in the USA whose chairman is Dr. M. Al-Wakeel (a professor at Wisconsin University) presented fifty ZX Spectrum computers as a gift to the Egyptian ministry of education.

Sixty-six teachers were selected from 25 high schools by the ministry of education to begin their training on Sinclair ZX computers.

Dr. Maustafa K. Helmi, the Vice Prime Minister in the Egyptian government, was in the opening ceremony of the first computer training course ever held in Egypt for its high school teachers.

Many Egyptian high schools have started teaching computer courses. The teachers at these schools noticed that the students' grasp of chemistry, math, and physics has dramatically increased due to the use of the computers in their classes.

The ministry of education has plans to utilize Sinclair computers in most Egyptian high schools. TSH

U.S. FEDERAL COURT USING ZX-81,TS

Debra Ruth Wolin, a staff attorney for the United States District Court, Southern District of New York, informs us that she has successfully used her 64K expanded Timex-Sinclair 1000 to solve an administration problem of the court's pro bono panel. She had to assign the right lawyer to the right case from a panel of volunteer lawyers willing to represent poor people in court without charge. She was assisted by Erica Jean Wolin, a systems analyst for NYNEX Service Co., who wrote a program which is basically search and sort with additional features built-in. The program stores various data about the panel members such as, type of case the member will take, date of last assignment, language ability and location (NY City or White Plains). To operate the program, Debra punches in the type of case, the location and any necessary language ability. The T/S computer returns a list of members in reverse chronological order of most recent assignment. Debra then assisgns the case to the appropriate member.

Debra tells us she would be happy to share the program with any non-commercial user. If interested, please send a SASE to our club. She is our member for two years.

FROM ZX WORLD NEWS BULLETIN Sept/Oct '85
Box 560 Wall St., New York NY 10005.

A TRIP TO SINCLAIRLAND

Tony Brooks of the Capitol Area T/S User Group was in the United Kingdom recently and reported on his observations of the computer market there in the CATS newletter (Oct. 85). Here is a small portion of that report:

"This summer I spent three weeks in Europe, two of them in England. While in England I took the opportunity to purchase some Spectrum software and hardware and look at the home computer market in Britain...On the basis of what I saw Sinclair computers are by far the most popular. All stores boasting any sort of computer department carry Spectrums and usually QLs...Based on what I saw the Amstrad CPC464 and 664 are second to the Spectrum...All the remaining home computers offered in Britain seemed to be way behind these two.

"If you are looking for Spectrum software in British stores, you will probably at first be delighted to see lots of Spectrum software at low prices. Then you may be disappointed when you can't find any item on your list. Basically two kinds of sofware are usually available: the very latest top ten most popular games and 'old' softwarew from last year or before. By the time we hear about Spectrum software in the U.S.A., it's out of the top ten but not yet on the discount shelves.

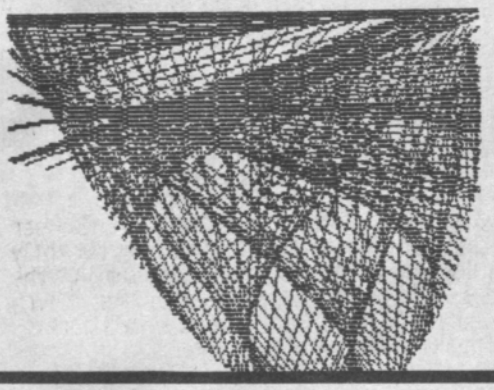
"The home computer market in Britain is almost totally games oriented, and most British computer magazines seem aimed at games players under 20. Nevertheless, this has led to a high rate of computer ownership, considerably higher than in the U.S.A. and second only to Japan." TSH

try these

TS 2068

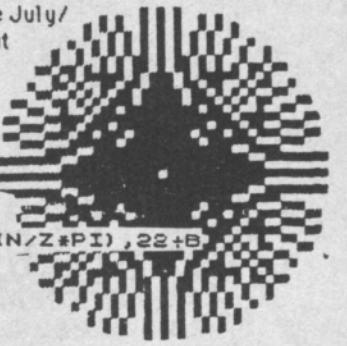
This program was printed in an old issue of Synapse, the newsletter of the Central PA User Group.

```
 20 PRINT "Enter 4 numbers betw
een 1 and 20"
 30 INPUT a,b,c,d
 35 CLS
 40 LET t=0
 50 LET x1=125+125*SIN (a*t)
 60 LET y1=87+87*SIN (b*t)
 70 LET x2=125+125*SIN (c*t)
 80 LET y2=87+87*SIN (d*t)
 90 PLOT x1,y1
100 DRAW x2-x1,y2-y1
110 LET t=t+.01
120 GO TO 50
```



TS1000

This program by Randy Adams of Santa Cruz CA was printed in the July/ August issue of SYNC. Input numbers between 1 and 100. (Try 26, 31, 32,35,and 38).



```
  5 INPUT Z
  7 CLS
 10 FOR B=1 TO 20
 15 FOR N=1 TO 2*Z
 20 PLOT 31-B*COS (N/Z*PI),22+B
*SIN (N/Z*PI)
 25 NEXT N
 30 NEXT B
```

TS 2068

This colorful program was submitted by subscriber Doug McRoy of Laurel MD.

```
1000 REM Color slash
1001 CLS : PAPER 0: CLS : BORDER
 0: CLS : BORDER 0
1002 INK 7: DRAW 0,175: DRAW 255
,0: DRAW 0,-175: DRAW -255,0
1003 FOR q=0 TO 7
1005 FOR l=0 TO 56 STEP 8
1007 FOR m=0 TO 56 STEP 8
1010 LET l=INT (RND*88)+0
1015 LET m=INT (RND*128)+0
1020 PLOT m,l: INK q: DRAW m,l
1030 NEXT m
1032 NEXT l
1040 NEXT q
1045 GO TO 2003
2003 FOR q=0 TO 7
2005 FOR l=175 TO 119 STEP -8
2007 FOR m=256 TO 200 STEP -8
2010 LET l=INT (RND*88)+0
2015 LET m=INT (RND*128)+0
2020 PLOT 255-m,174-l: INK q: DR
AW -m,-l
2030 NEXT m
2032 NEXT l
2040 NEXT q
2045 GO TO 1003
```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ALPHA STAINGS

Letters from our Readers

Dear Scott,

I just thought I would drop you a short note to say that your publication is one the finest. I look forward to receiving each issue. It's frustrating sometimes when the issue is late but being co-editor of a users group newsletter (KEYBOARDS, TASBAM UUsers Group, ST. Petersburg FL) I know what your up against getting each issue out on time. Keep up the good work.

I would like to comment on a letter in issue no. 14, from Barry E. Henley...referring to the A&J Microdrive and a routine for verifying a program or data saved under a variable name such as A$. Barry's routine went like this:

```
1 LET A$="@1,game"
2 SAVE A$
3 let A$(3)="@"
4 VERIFY A$(3 TO )
```

Much to my dismay, this did not work. The problem is that in line 1, A$ is defined as "@1,game" and the program is saved. Then in line 3 A$is redefined (a$(3) was a "," now defined as "@") then the verify is called. Verify will stop with "R TAPE LOADING ERROR" because of redefining the variable A$.

The correct syntax is:

```
1 LET A$="@1,game"
2 SAVE A$
3 VERIFY A$(1)+A$(4 TO )
```

Please share this information with you readers.

Thanks, Frank Leta, TASBAM, P.O.Box 644, Safety Harbor, Florida 33572

Consider it shared Frank. **R.D.**

Dear Mr. Duncan,

I thought you might like to tell your readers that Jameco, 1355 Shoreway Rd., Belmont CA 94002, (415)592-8097, is having a tremendous sale on IC chips. In particular, the company is selling 64K RAMs, the ones used for TS memory boards, at over 75% off! Their 4164-200ns chips are $1.11/pc, andtheir 4164-150ns are $1.21/pc!! They only have about 100,000 left, so we-all had better hurry before Radio Shack buys them up and sells them at a 200% profit!

Jameco requires a minimum order of $10.00, S&H are 5% of order, $1.00 minimum.Insurance is $1.50.

Cordially, Gary Insley

Dear Rick Duncan,

I'd like to start by telling you guys what a great job you're doing! I've enjoyed your magazine immensely and have used so much of the information. I wait and watch the mail for the next packed issue of T.S.H. like a hungry dog! When you get behind and send one issue for two months, I'm very hard to live with. Keep up the good work, guys. The support, hints and new product info for the great little $15 computer is very, very much appreciated!!!

I was licking the flap on a letter to you, when the issue #13 arrived. I was asking if Gordon Young was going to be back in action soon. I had ordered from him (first of March) an author's copy of his outstanding WORM program, and haven't received it. We, in our little group had each entered the WORM and pulled out some hair, debugging the "CRASH IN MID TEXT" gremlin. I thought that a clean copy would help and that we must have done something wrong. In the Feb/March issue you said he had been ill. We hope he is well very soon and will write some more good stuff.

Anyhow, thanks to Mr. Allen Wolach for the WORM enhancements (Issue 13). The added REM statements appear to be the solution. I think Allen should get the wonder award for his ingenious additions.

Speaking of the WORM, (you may print any of this if you like) for those of you using ASCII printers with Gordon Young's outstanding WORM word processor program, here is how to change WORM to include the punctuations, exclamation mark(!) and apostrophe(').

To accomplish this, we'll lose the use of the ">" greater than and the "<" less than signs, but who needs-em? They're about as useful as a membrane keyboard when entering text. If you're using the Timex 2040 printer, these changes, of course, won't apply.

The Sinclair / ASCII equivalents for exclamation mark and apostrophe are "[?]" inverse question and "[,]" inverse comma, respectively. All we need do is insert their codes into the right place in REM statement 3. This will nul the greater than ">" sign on the M key, in P (punctuation) mode and give us apostrophe on the comma key in the punctuation mode. The period and (shift) comma will still be active. The "<" less than sign on the N key will become the exclamation mark in the punctuation mode.

Load and run the WORM, then break into the program and key directly in the following:

```
POKE 17856,154
POKE 17857,143
POKE 17874,27
GOTO 10        to return to the menu.
```

That's it, make (SAVE) a new copy and you've got a new WORM.

If there is any T.S. user who doesn't have the WORM and wants a word processor program, get it! It has to be the most useful program ever written for the TS 1000. A good printer, key board conversion and monitor and you've got a very useful system. (Back issues 5, 6, 7, 9 and now 13). Hats off to Gordon Young!

P.S. Is there any one out there in T.S.H. land who can figure a way to the WORM's cursor to blink so it won't get lost in the text? That's about the last improvement the WORM needs, besides a dictionary.

Thanks again to T.S.H. staff and contributing authors. When do we get cartoons?

Till next time, Neal Paddison,
1932.SE REX, Portland OR 97202

Sheesh! Some people are never satisfied. Seriously Neal, thanks for the nice letter and the helpful hints. Sorry for the long wait again.

Dear Duncans,

A few months back I enjoyed the series on Gordon Young's word processor "WORM", which I am now using with a used centronics printer. Now I see in your April issue (No. 13) an article by Allen Wolach about "WORM ENHANCEMENTS", particularly the part about not right-justifying the text. Unfortunately, his modification won't work with the printer and interface I use. So I made the following change in my program to accomplish the same end. Perhaps other readers may be able to use this idea.

In the immediate mode, POKE these addresses:
18197,195
18198,129
18199,71

What this does is cause the program to jump past the routine that actually does the right-justifying and continue with the routine that moves the text to the buffer to be printed. To return to the original method, POKE:
18197,6
18198,0
18198,33

I actually included a menu option to perform these POKEs for me so that I can choose mid-program to change format. I must say I enjoy using my Sinclair as a typewriter. Gordon Young's offering has been a welcome addition to my program library.

Keep up the good work!

Sincerely yours,

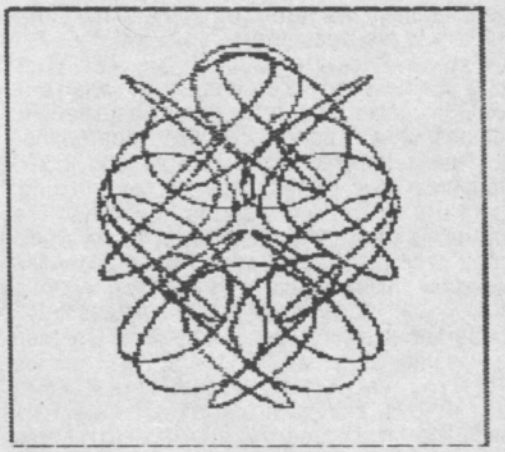
Jack Frost

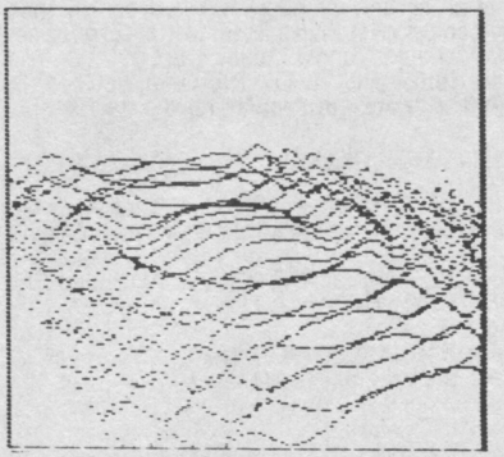
Dear TS Horizons,

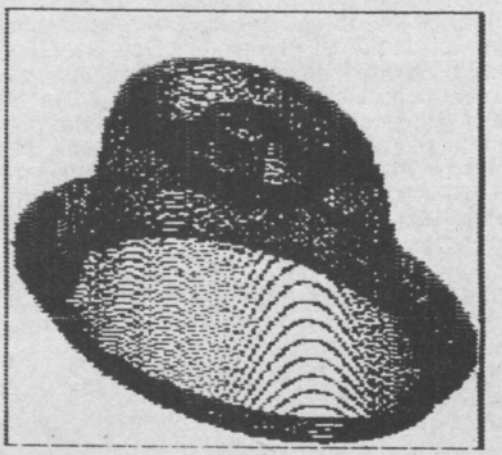
I have received a sample & demo of CALLISTO SOFTWARE's new ZX Hi-RES, a software Hi-Res for the standard ZX/TX machine. ZXHR has very nice 128*192 plotting (derived from 256*192 input), upper & lower case onscreen, and a comprehensive toolkit of fast graphics routines built in, including Draw, Ellipse, Triangle, Box, Quadrilateral, Fill, Plot, Invert, Copy, 3D shape rotation, and 40 Fill patterns. Enclosed are copies of some neat stuff I've printed out using ZXHR. The 3D plane figures were actually approximated piecemeal using the Draw function. The Hi Res Hat (see TSH #13, p. 8-9) and the Circular Waves were done using the Plot function.

Not too shabby for a ZX81, eh!

Best regards,
Peter McMullin, 2340 Queen St. E., Toronto, Ontario, Canada M4E 1G9







2068 Line Renumber Routine "IN SYNC" by John Bell

When TIMEX redesigned the Spectrum, the software engineers rewrote and expanded the original 16K ROM. They added several new features that increased the versatility of the 2068. They did, however, make some notable omissions. The most unfortunate of which is the lack of a renumbering routine. I have a machine code program that renumbers the entire BASIC program, including the statement numbers after GOSUB and GOTO commands. After using this routine for a while, I found it very inconvenient to renumber the entire program when I only wanted to change the line numbers in a subroutine.

Being a die-hard programmer, I wrote a BASIC program that will renumber specific sections of a program. It does not change the line numbers after GOSUB and GOTO commands, but you can't have everything, especially when programming in BASIC. The program is very straightforward in its operation, prompting the programmer for the necessary information.

To use the program, enter the program fron the listing provided, SAVEing it to tape before you test it. If you made a mistake in the entry of the program, it will destroy itself the first time you use it. After you have an error free copy of the program then you can SAVE it on a cassette for future use. You can set up a test program of REM statements and follow the instructions in the next section to test the program.

Instructions for use:

Load the program you are working on into the 2068, then MERGE the renumbering program onto the end of yours. To use the program, type GOTO 9980. If you use RUN 9980, you will erase any variables you might have stored in memory. The first prompt requests the line number you wish to start the renumbering process at. Enter the desired number then press the ENTER key.

The program then requests the desired values for the number to start the renumbering with, the amount you want the line numbers to increment and the line number you want the program to stop renumbering at. The last prompt enables you to cancel the renumbering process by entering "0". If you enter any other value or letter, the program will RUN using the values you entered previously.

If you enter any line number greater than 9979 in response to the "Stop at line number?" prompt, the program stops automatically at 9979. Try entering "0" for the value to start renumbering with and for the line increment. Be warned, however, that this will make the program uneditable both to hackers AND the programmer! Also note that if you have a command that says, say "GOTO 100" and you have changed line 100 to "0" or any other number, your program will not work. You HAVE to maintain all of the line numbers that are accessed by GOSUB or GOTO commands. In any case, it takes some playing around with this program before you get to know exactly what it will do.

The only limitation the renumbering routine places on the programmer is that you can't use any line number above 9979. It is compatible with TIMEX and SINCLAIR ROM chips installed in your machine. However, if you have the misfortune to be programming on a ZX/81, you will have to rewrite the program to comply with the syntax of that computer. You will also have to change the following numbers in line #9990 (23635 to 16509 and 23636 to 16510).

I hope the renumbering routine makes your programming easier and more rewarding. Next time I'll have a machine code routine that lets you save and recall a graphics screen INSTANTLY. TSH

```
9980 INPUT "Start renumbering at
? ";startline
9981 PRINT "Start renumbering at
 line; ";startline
9982 INPUT "Start renumbering wi
th? ";startnum
9983 PRINT "Start renumbering wi
th; ";startnum
9984 INPUT "Line increment? ";li
neinc
9985 PRINT "Line increment; ";li
neinc
9986 INPUT "Stop at line number?
 ";stopline
9987 PRINT "Stop at line number;
 ";stopline
9988 INPUT "Press any key to con
tinue,       ""0"" to stop; ";sto
p
9989 IF stop=0 THEN STOP
9990 LET startloc=PEEK 23635+256
*PEEK 23636
9991 LET linenum=(PEEK startloc)
*256+PEEK (startloc+1)
9992 LET length=PEEK (startloc+2
)+PEEK (startloc+3)*256
9993 IF linenum<startline THEN G
O TO 9998
9994 IF linenum>=stopline OR lin
enum>9979 THEN STOP
9995 POKE startloc,INT (startnum
/256).
9996 POKE (startloc+1),startnum-
(INT (startnum/256))*256
9997 LET startnum=startnum+linei
nc
9998 LET startloc=startloc+4+len
gth
9999 GO TO 9991
```

CLOVER
A Graphics Program for the 2068
By Bernard Bush

"Clover" creates a variety of geometric designs, based on a fairly simple principle. If you plot several points around a circle and at each point, draw a square, a diamond or other shape, the TS 2068 will create a design. Each time you increase the plotted points by 2, a different design forms. My program is designed to create a variety of shapes. A second part of the program, by drawing vertical and horizontal lines through the picture, actually makes four different pictures, the last one switching the paper and ink colors. I discovered these things more or less by accident, while combining part of two programs.

```
   5 REM  CLOVER
   6 REM   B. BUSH MAR 84
 500 REM
 542 BRIGHT 1: LET L=6
 545 CLS : OVER 1: RANDOMIZE 0
 546 LET A1=INT (RND*8)
 547 IF A1=3 OR A1=4 OR A1=5 THE
N GO TO 546
 548 PAPER A1
 550 INK 9: BORDER RND*7
 551 LET U=INT (RND*3)+1
 552 REM SET U = 1 OR 2 OR 3
 553 LET R=INT (RND*35)+5
 555 CLS : LET B=2
 560 LET G=100: LET V=42
 565 LET W=0
 566 LET F=INT (RND*6)+1
 567 DRAW 0,175: DRAW 255,0: DRA
W 0,-175: DRAW -255,0
 570 REM              MAIN ROUTINE
 580 FOR T=1 TO L
 585 LET V=42
 590 LET A=T/(L/2)*PI
 595 LET X=127+42*COS A
 600 LET Y=87+42*SIN A
 605 FOR V=R TO 42 STEP F
 606 IF U<3 THEN GO TO 610
 607 FOR V=42 TO 42
 610 PLOT X,Y+V: DRAW V,-V,W: DR
AW -V,-V,W: DRAW -V,V,W: DRAW V,
V,W
 615 IF U=2 THEN PLOT X,Y+V: DRA
W V,0: DRAW 0,-2*V: DRAW 2*-V,0:
 DRAW 0,2*V: DRAW V,0
 616 LET V=V+1: PLOT X,Y+V: DRAW
 V,-V,W: DRAW -V,-V,W: DRAW -V,V
,W: DRAW V,V,W
 617 IF U=2 THEN PLOT X,Y+V: DRA
W V,0: DRAW 0,-2*V: DRAW 2*-V,0:
 DRAW 0,2*V: DRAW V,0
 620 NEXT V
 625 NEXT T: PAUSE G:
 630 LET L=L+2
 635 REM              FILL LINES
 640 INK 9: FOR J=1 TO 255 STEP
B: PLOT J,0: DRAW 0,175: NEXT J
 645 PAUSE G
 650 FOR J=175 TO 1 STEP -B: PLO
T 0,J: DRAW 255,0: NEXT J
 655 PAUSE G
 660 FOR J=255 TO 1 STEP -B: PLO
T J,0: DRAW 0,175: NEXT J
 665 PAUSE G
 670 FOR J=0 TO 175 STEP B: PLOT
 0,J: DRAW 255,0: NEXT J
 680 PAUSE 150: GO TO 545
```

There are some changes you can make to alter the program further.

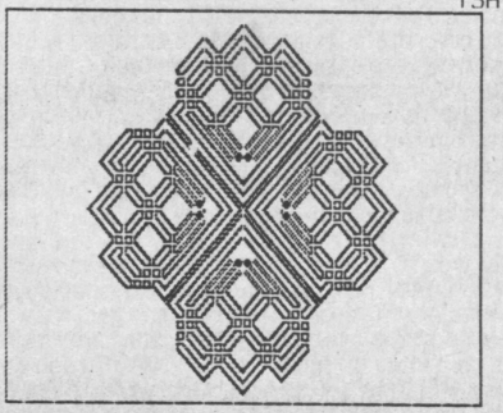
Line 552: By changing this line to LET U=1, you can bypass the random number and get similar designs each time. To see what is affected follow U through the program.

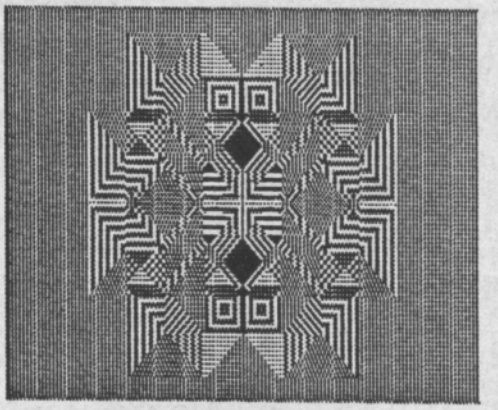
Line 542 sets the variable L. This can start as low as 4. The program will start at 4 plotted positions, and increase by 2 each time. Use even numbers or designs will be non-symetrical. When the number gets higher, the drawing slows down.

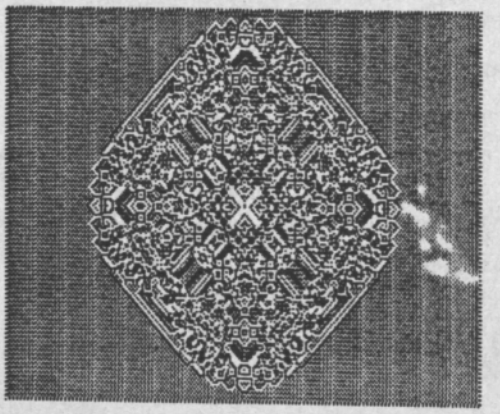
Line 595: If you change the number 42 to as high as 80, you will get designs which are more rectangular in form.

Line 560: G determines the length of the PAUSE. If you wanted to print some of the designs, make this number higher, so that you can stop the program before it changes.

TSH







by Walt Coleman

Have you ever thought you'd like a backup copy of a valued program but couldn't break into it to save it? Or have you ever admired a feature of a program and wanted to look at it to see how it's done? Then this short (12 byte) program is for you.

The 8K Sinclair ROM provides features that many more expensive computers lack. Unfortunately, to accomplish this, many M/C routines are intertwined and using them for our own purposes are difficult if not impossible. Many sources will provide the starting addresses of the LOAD (832 dec.) and BREAK (930 dec.) routines. But how can we combine these to load a program and then stop it so we can list or save it?

For you M/C lovers, the first three bytes of the LOAD routine in turn calls another routine whose purpose it is to identify the name of the program to be loaded. If there is no name, as in the case of LOAD"" then the Carry Flag is set and then the seventh bit of the D Register is set to 1. If the Carry Flag can be set and the D Register loaded, this routine can be bypassed and the LOAD routine accessed by a USR call. The first program it comes to on a tape will be loaded. If we follow the load routine call by a break routine call we will have accomplished our purpose of loading and stopping our "unbreakable" tape.

STOPPER

MNEMONIC	COMMENT
LD A, 1	Force Carry
SRA A	Flag to 1
LD D, 0	Set D Register
Call 835 (dec.)	Access LOAD Routine 3 bytes in
Call 930 (dec.)	Access BREAK Routine

So much for the technical aspects, let's get down to the implementation. For the STOPPER to work, the T/S 1000 must be in FAST mode and the program must be outside of RAM so it will not be overwritten by the program we are loading. To do this we will reserve a minimal area above RAMTOP.

STEP 1 : FAST
STEP 2 : POKE 16388,242
POKE 16389,127
NEW Then FAST

STEP 3 : Enter the following program:

```
10 LET S=0
20 FOR I=1 TO 12
30 INPUT A
40 POKE (32754+I),A
50 LET S=S+A
60 NEXT I
70 PRINT AT 0,0;"SUM=";S
```

STEP 4 : Run the program and ENTER this list of numbers:
62,01,203,47,22,00,205,67,03,205,162,03
STEP 5 : Your sum should be 980. If not, run STEP 3 and enter the numbers in STEP 4 again.
STEP 6 : Now use STOPPER by entering RAND USR 32755 and turning on your tape recorder. If the load has been successful you will view a blank screen with the message D/O. If not, use the "usual" recorder adjustments to correct a normal unsuccessful LOAD and try again from STEP 6.

If you have any comments or problems, I'm always glad to hear from you.

Walt Coleman
728 Seville Avenue
Wilmington, DE 19809

TSH

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To order send $19.95 plus $2.00 P&H for cassette and manual: Tom E. Cole, 1314 Speight #15, Waco, TX 76706.
Texans add local tax.

"QUICK - BALANCE"
By Bob Woish
TS1000/ZX81

One of the many uses for home computers has been to keep track of the family checking account. Many of the commercially available account manager programs include a routine to update checkbook balances daily, or even by check. I've yet to meet the person who carries his home computer everywhere he writes a check! I'm equally sure that after the inital 'novelty' wears off, nobody really updates his personal computer of checking transactions on a daily basis.

How about checkbook balancers? I've found this one really eases the drudgery of monthly reconciliation between checkbook and bank. I've used this one now for well over a year and can honestly say I use it not for any novelty value, but because it really does save time and make the job lots easier. You only need to load it once a month, not every day. That's what makes it more efficient to use. Any time loading and using a home utility program takes less time than doing the same job manually, the program has justified itself.

Quick-Balance is easy to use in that it presents prompts from within the program for all the information it needs from the user. About all you need to know is that to exit the outstanding checks or unposted deposits routines, you need only to enter '0'. The program will then go on to prompt you for corrections, while you check your entries against screen output. Also, if you have a 2040 printer connected and running, the program will output a hardcopy of everything you may ever need to know, should you need that information at a later time. As it stands, Quick-Balance will handle up to 26 outstanding checks and 26 unposted deposits. You could expand this by increasing the DIMentions in lines 115 and 325. These values are currently 64, which is 26 (the number of possible entries) plus 38 (the character code for 'A'). Thus the lettered labels for checks or deposits progress alphabetically. If you expand on these, be ready for some strange output, as the character codes from 67 thru 111 are not used and will print as question marks. This is not important as long as you don't need to make corrections later. In that case, you will have to type in 'CHR$ xx' to change incorrect entries. Remember to erase the quote marks first, or the error trap in line 225 or 405 will not allow corrections.

Try Quick-Balance. You'll be pleased with it's ease of use. TSH

```
  1 PRINT TAB 9;"QUICK-BALANCE"
  2 LPRINT TAB 9;"QUICK-BALANCE
  3 REM ----BY BOB WOISH----
  5 LET E=CODE " "
 10 LET H=E
 20 PRINT ,," INPUT CHECKBOOK B
AL:"
 25 LPRINT ,," INPUT CHECKBOOK
BAL:"
 30 INPUT A
 40 PRINT "$";A
 45 LPRINT "$";A
 50 PRINT " INPUT ENDING STATEM
ENT BAL:"
 55 LPRINT " INPUT ENDING STATE
MENT BAL:"
 70 INPUT B
 80 PRINT "$";B
 85 LPRINT "$";B
100 PRINT " INPUT DEP. IN CHECK
BOOK BUT NOT"
105 LPRINT " INPUT DEP. IN CHEC
KBOOK BUT NOT"
110 PRINT "ON STATEMENT"
112 LPRINT "ON STATEMENT"
115 DIM D(64)
120 LET C=38
125 LET F=C
130 INPUT D(C)
135 SCROLL
140 IF D(C)=0 THEN GOTO 190
150 PRINT CHR$ C;") $";D(C)
155 LPRINT CHR$ C;") $";D(C)
160 LET E=E+D(C)
170 IF C>51 THEN SCROLL
175 LET C=C+1
180 GOTO 130
190 GOSUB 900
220 IF A$="" THEN GOTO 290
225 IF LEN A$>1 THEN GOTO 190
230 PRINT "CHANGE: ";A$
235 LPRINT "CHANGE: ";A$
240 LET C=CODE (A$)
250 LET E=E-D(C)
252 SCROLL
255 PRINT " INPUT CORRECT AMT:"
257 LPRINT " INPUT CORRECT AMT:
";
260 INPUT D(C)
265 PRINT D(C)
267 LPRINT D(C)
270 LET E=E+D(C)
280 SCROLL
285 GOTO 190
290 CLS
292 PRINT AT 18,0;"DEP.NOT ON S
TATEMENT=$";E
294 LPRINT AT 18,0;"DEP.NOT ON
STATEMENT=$";E
300 SCROLL
315 PRINT " INPUT OUTSTANDING C
HECKS:"
317 LPRINT " INPUT OUTSTANDING
CHECKS:"
320 SCROLL
322 DIM D(1)
325 DIM G(64)
340 INPUT G(F)
350 IF G(F)=0 THEN GOTO 390
360 PRINT CHR$ F;") $";G(F)
362 LPRINT CHR$ F;") $";G(F)
365 SCROLL
370 LET H=H+G(F)
380 LET F=F+1
385 GOTO 340
390 GOSUB 900
400 IF A$="" THEN GOTO 480
405 IF LEN A$>1 THEN GOTO 390
410 PRINT "CHANGE: ";A$
412 LPRINT "CHANGE: ";A$
420 SCROLL
430 LET F=CODE (A$)
```

Continued on page 15...

LOGIC FAMILIES

by Paul Hunter

When I started working with electronic circuits, and IC's in particular, a few years ago, I scarcely knew what TTL stood for. Now the proliferation and expansion of various logic families has provided an even more bewildering array of IC's from which to choose. This article is a collection of data from various data books and specification sheets and is intended to provide a useful source of information when you have to choose what kind of IC to use for your projects and what, if any, interface is required between the various families. Some of the earlier and some of the less common varieties have been omitted.

FAMILIES

TTL	(7400 series)	regular transistor-transistor logic
LSTTL	(74LS series)	low power schottky (fast switching) TTL
ALSTTL	(74ALS series)	advanced LSTTL (faster and more economical in power)
CMOS	(4000 series)	complementary metal oxide semiconductor (slow)
HCMOS	(74HC series)	high speed CMOS (as fast as LSTTL)
HCTMOS	(74HCT series)	high speed TTL compatible CMOS

Principal characteristics of the logic families are listed below:

	TTL				CMOS	
	7400	74ALS	74LS	74HCT	74HC*	4000*
Supply voltage	5V	5V	5V	5V	2-6V	3-18V
Power dissipation/gate	10mW	1mW	2mW	2.5nW	2.5nW	2.5nW
Speed (delay/gate)	10ns	4ns	9ns	8ns	8ns	40ns
Logic 1 min high input	2.0V	2.0V	2.0V	2.0V	3.15V	3.5V
Logic 0 max low input	0.8V	0.8V	0.8V	0.8V	0.9V	1.5V
Logic 1 min high output	2.4V	2.7V	2.7V	4.0V	4.0V	4.5V
Logic 0 max low output	0.5V	0.4V	0.5V	0.26V	0.26V	0.4V

* assuming 5V operation

Notice that the newer 74HCT devices are direct replacements for the 74LS -- with better output voltage characteristics (wider noise margins) and much lower power requirements.

FANOUT

The ability of one device to drive another can be calculated by dividing the maximum output current of the driver by the required input current of the device being driven. The fanout at both logic levels should be calculated and the lower of the two taken as the limit. The results can be summarized as follows:

		TO THIS DEVICE					
			TTL			CMOS	
		7400	74ALS	74LS	74HCT	74HC*	4000*
FROM THIS DEVICE	7400	10	20	20	*	**	**
	74ALS	5	20	20	*	**	**
	74LS	2	20	10	*	**	**
	74HCT	2	20	10	*	*	*
	74HC	2	20	10	*	*	*
	4000	0***	2	1	*	*	*

* Unlimited but delays due to input and lead capacitance should be considered.

** Logic levels are incompatible but 74HC levels can be made compatible if the supply voltage to the 74HC is reduced to 3V.
Pull-up resistors (1 to 10K) can raise TTL outputs to required CMOS levels (small value for speed but a larger value for less power required).

*** Buffered CMOS outputs can sink up to 1.6mA and can drive one or two TTL devices.

Different supply voltages can be accommodated. A CMOS buffer (eg. 4049/50 etc.) can interface 15V CMOS to 5V TTL. A 7406/7 (30V max) or a 7416/7 (15V max) can raise TTL to CMOS voltage levels. Discrete transistors can also be used to interface the different logic families.

If you can find them, and afford them (actually they're quite cheap), start using the 74HCT devices in place of 74LS.

SOME NOTES ON THE BANK SWITCHING SERIES

Another bug has surfaced in the listing provided in issue 11 -- to avoid it do not answer 'z' to see the directory before flagging a file for subsequent purge. The program has been corrected (version 1.3). In addition, the virtual memory routines have been incorporated into the 2K program and some system variables added to service these routines. This makes the automatic switching in and out of subroutines much easier.

Rather than inundate TSH with yet another listing, the new program (version 1.3) and the new memory map is available for those of you who want it (please send $1 for xeroxing and postage). Version 1.3 is available on cassette tape for $10 ppd as noted previously. Those of you who purchased an earlier version will receive the updated cassette automatically. The program will also be available on EPROM (2716 or equivalent E2PROM) for $15 ppd.

TSH

```
 440 LET H=H-G(F)
 450 PRINT " INPUT CORRECT AMT:"
 452 LPRINT " INPUT CORRECT AMT:
";
 455 INPUT G(F)
 460 PRINT G(F)
 462 LPRINT G(F)
 465 LET H=H+G(F)
 470 SCROLL
 475 GOTO 390
 480 CLS
 482 PRINT "TOTAL OUTSTANDING CH
ECKS=$";H
 484 LPRINT "TOTAL OUTSTANDING C
HECKS=$";H
 500 LET I=B+E-H
 505 PRINT "YOUR BAL=";A
 507 LPRINT "YOUR BAL=";A
 520 PRINT "ADJUSTED BANK BAL=";
I
 522 LPRINT "ADJUSTED BANK BAL="
;I
 525 IF ABS (A-I)<.0001 THEN GOT
O 960
 530 PRINT "CHECK FOR ERRORS"
 532 LPRINT "CHECK FOR ERRORS"
 540 STOP
 900 SCROLL
 905 PRINT "CHANGES? ( INPUT LET
TER)"
 907 LPRINT "CHANGES? ( INPUT LE
TTER)"
 910 SCROLL
 920 PRINT "IF NONE, HIT ""ENTER
"""
 922 LPRINT "IF NONE, HIT ""ENTE
R"""
 930 SCROLL
 940 INPUT A$
 950 RETURN
 960 PRINT "BALANCED"
 962 LPRINT "BALANCED"
```

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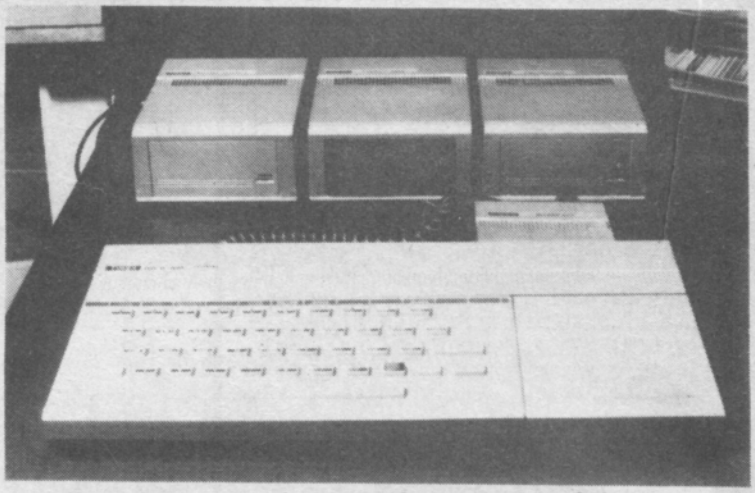

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MORE NOTES ON VU-CALC
by Charles Peterson

James W. Holder wrote how to program an 80-column print-out from Vucalc in Issue 15. Being able to do so is a big step forward in putting Vucalc to practical use. I shelved my copy of the program for a while for two additional reasons. 1) The keyboard response is slow. 2) Once you have entered data into the array, B$, you cannot add, delete, or edit BASIC lines. If you do, the program will crash when you CONTINUE.

Recently I discovered two modifications which overcome these problems. One changes the timing of delay loops. The other reinitializes Vucalc's machine code every time you re-enter the program through the "C" (CONTINUE) option. Thus, you can add, delete, and edit BASIC lines whenever you want and still CONTINUE with the program. These improvements can be added to a copy of Vucalc which already has titles and formulas in it.

First, speed up the keyboard response by changing the value of the main timing loop. You will also have to slow down the cursor. Load the program and STOP it. Type in the following commands and press ENTER after each.

COMMAND	DESCRIPTION	ORIGINAL VALUE
POKE 17459,100	MainTimingLoop	0
POKE 17592,25	Cursor delay	10
POKE 17600,25	Cursor delay	10

Check out the results with GOTO 110. Enter the "E" or "C" option. Add a title and notice how much faster the keys respond.

Next, add some machine code to allow editing. STOP the program again. Add a REM line to hold the machine code and a program for loading it.

```
  14 REM 12345678901234567890123
45678901234

6000 DIM A$(4)
6010 FOR I=19656 TO 19689
6020 INPUT A$
6030 POKE F,VAL A$
6040 PRINT A$;
6050 NEXT F
6060 DIM A$(0)
```

Line 6060 is of special interest. It will clear the variable A$ from memory. All other variables will be left intact. The program stops with a 3/6060 report.

Before loading the machine code, make sure the REM line is long enough. The command, PRINT PEEK 19653, should print 36 on the screen. Start the loader with the command GOTO 6000. When the cursor (in quotes) appears, enter the following numbers one at a time. Go from left to right and top to bottom.

```
 58  134  64  167  40   24  42  16
 64    1 238   32   9    1  35   0
 17    3  65  235 115   35 114  35
 35  235   9   61  32  245 205 143
 65  201
```

Those who have a hex loader can use the following:

```
4CC8    3A8640        LD A,(16518d)
4CCB    A7            AND A
4CCC    2818          JRZ CALL
4CCE    2A1040        LD HL,(VARS)
4CD1    01EE20        LD BC,8430d
4CD4    09            ADD HL,BC
4CD5    012300        LD BC,35d
4CD8    110341        LD DE,16643d
4CDB    EB      POKE  EX DE,HL
4CDC    73            LD(HL),E
4CDD    23            INC HL
4CDE    72            LD(HL),D
4CDF    23            INC HL
4CE0    23            INC HL
4CE1    EB            EX DE,HL
4CE2    09            ADD HL,BC
4CE3    3D            DEC A
4CE4    20F5          JRNZ POKE
4CE6    CD8F41  CALL  CALL 16783d
4CE9    C9            RET
```

Once the machine code is loaded, edit line 2000 to read:

```
2000 LET Z=19656
```

Save the program at this point. Then restart Vucalc with GOTO 110 and type the "c" option to CONTINUE. If you have made a mistake, you will know it. The screen will be messed up. Unplug or reset to begin again. If all is well, you can now add and delete BASIC lines even when B$ has data in it.

Holder showed how to print out the whole grid, a page at a time. It is also possible to print out selected boxes. For those who like to custom tailor their program, here are some tips on printing out Vucalc data. All the information in Vucalc's grid is stored in B$(2 to 8424).

	01	02	03
A	B$(2 TO 9)	B$(236 TO 243)	B$(470 TO 477)
B	B$(11 TO 18)	B$(245 TO 252)	B$(479 TO 486)
C	B$(20 TO 27)	B$(254 TO 261)	B$(488 TO 495)

Adding the following routine will allow the computer to calculate the location of any box for you.

```
6000 PRINT "ENTER ROW/COLUMN:""B03"""
6010 INPUT A$
6020 LET Z=9*(CODE A$-38)+2
6030 LET Z=Z+234*(VAL A$(2 TO)-1)
6040 PRINT A$;TAB 5;"B$(";Z;" TO ";Z+7;")";
6050 PRINT TAB 23;B$(Z TO Z+7)
6060 GOTO 6010
```

Start the routine using GOTO 6000. When the cursor (in quotes) appears, enter the row and column number of a box containing information. Use the format: "D05", "R27", etc. The routine will print the location and contents of the box to the screen. To STOP this routine, press ENTER when the cursor asks for an input.

Finding and printing one box at a time is not very useful. Let's assume you want to print boxes A01 through A03 and C01 through C03. The following lines will do it for you.

```
7000 FOR F=2 TO 20 STEP 18
7010 LET P$=""
7020 FOR G=F TO F+468 STEP 234
7030 LET P$=P$+B$(G TO G+7)+" "
7040 NEXT G
7050 PRINT P$
7060 PRINT
7070 NEXT F
7080 STOP
```

NOTE: Quotation marks in line 7030 contain one space; in line 7010 they contain no space.

Line 7000 determines whether row A or C is printed. Line 7020 determines whether column 1, 2, or 3 is printed. It's a little tricky. It may be helpful to calculate by hand the value of G for each pass through the loops. Or, you could add the line:

```
7025 PRINT G
```

Use GOTO 7000 to start the routine. For hard copy, change the PRINT statements to LPRINT.

All of the above program lines will fit into a stock 16K Vucalc and you will have about 540 additional bytes of space for programming. If you eliminate lines 7000-7080, you will have about 690 bytes of space available for your own use. You could delete other program lines, particularly menu lines, and lines 6000 to 6060 as well. If you run out of memory, the program will not crash. You'll get a 'memory full' (4/line #) report. Sometimes the line you want to add to the program will stay at the bottom of the screen and not be inserted in the listing.

There should be just enough space left for you to program that custom print-out you've always wanted.

Charles Peterson
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MTERM and SPECTRUM

by David Hosher

At last! Now you can use your Spectrum ROM and MTERM without crashing on exiting the MTERM program. It's easy!

Because RAMTOP has to be lowered for MTERM to work with the Spectrum, make this little loader program.

Write this one line program.

```
10 CLEAR 53950: LOAD "" CODE: RANDOMIZE USR 54016
```

SAVE it using SAVE "MTERM" LINE 10.

LOAD the original version of MTERM code. Once loaded, add the following POKES.

```
POKE 54554,207: POKE 54555,255
```

SAVE this version on MTERM by entering: SAVE "MTERM" CODE 54016,7721. Save it on the tape you saved the one line program on.

Now LOAD your customized version of MTERM into your Spectrum. The program will autorun, so the loader program can be removed by erasing the buffer.

Now you can exit from MTERM without crashing. When you exit MTERM, the menu will still be on the screen, but a press on the enter key will get your listing.

One word of caution. The buffer controls will say that you have 30211 bytes in your buffer, but only about 30100 is usable. If you put more information than that in the buffer, MTERM will crash.

Thanks to Thomas Simon and Rick Conard for putting me on the right track for this routine.

TSH

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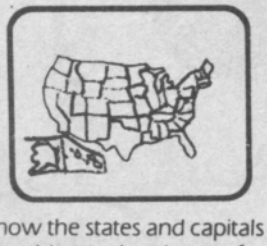

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Reviews by Tex

2068 SOFTWARE REVIEWS
by Tex Faucette

First, a word or two concerning joysticks for the budget-minded. One of the following reviews is of a product which requires a joystick in the left port of the 2068.

I obtained excellent results in reviewing that program by "borrowing" a joystick from a seldom-used ODYSSEY 2 video game which had been languishing in the closet. I would surmise that similar video game machines could be encountered at garage sales, flea markets, etc. at very reasonable prices.

Converting the Odyssey joystick for use on the 2068 was both cheap and simple. A pair of D-subminature 9-pin connectors from Radio Shack (Part No. 276-1537 and 276-1538) were utilized. The joystick cable was clipped close to the Odyssey case. This leaves sufficient leads remaining inside the case that the socket half of the connector pair may be installed therein, and the removed joystick may then be utilized either on the Odyssey or Timex machine.

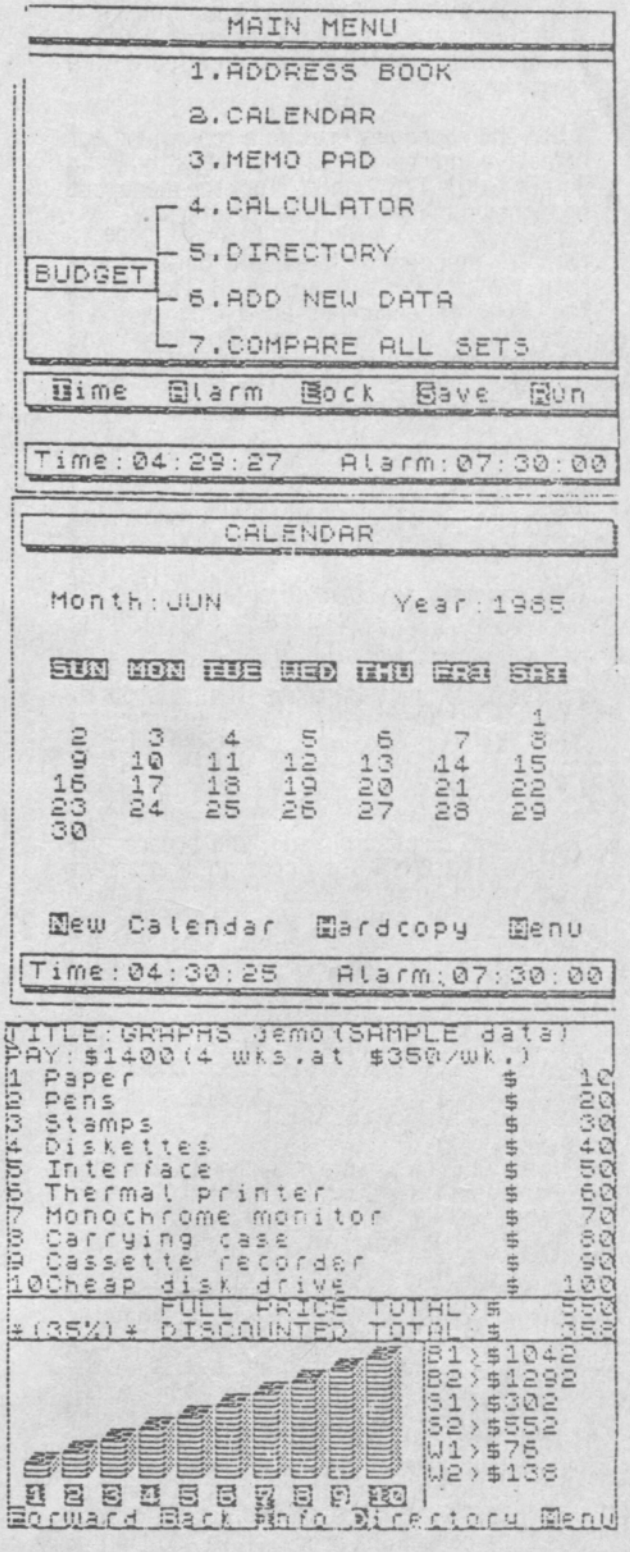
I used an ohmmeter to check the color coding of the joystick cable. I found that the black wire was common so it was connected to pin 8, which is "Read Strobe" on the Timex port. In like manner, red wire was connected to pin 1 (UP), yellow to pin 2 (DOWN), green to pin 3 (LEFT), orange to pin 4 (RIGHT), and white to pin 6 (BUTTON). Note that color coding may not always be the same for the joystick cables, but the functions given are correct for the 2068 joystick port. Pins Nos. 5, 7, and 9 are not used. I was also able to play Quicksilvas "Astro Blasters" (a fast-paced arcade type game) with the joystick, but had to use the keyboard for starting the game and claiming high scores.

Now the reviews.

"BIZ"

Copyright 1985 by Mike James
Available from Curry Computer, 5344 West Banff Lane, Glendale, AZ 85306. (Correspondence from Curry Computer indicated that the tape supplied for review contained a known division error in the calculator mode, which had been corrected on later tapes.)

"BIZ" is a home management program that goes a long way towards proving that fancy features are not limited to the big computers. Although actual file capacities are not large, "BIZ" has Memo Pad, Address Book, Calculator, Calendar, 24 hour Clock (with Alarm and Message), Budget Graphics ("3-D", quite attractive), Security Lock! (Forget your access code and it can be "unlocked" without destroying your data for a nominal fee!). "BIZ" even does windows. (That sounds like a detergent ad!) And the



Sample Screens from "BIZ"

calculator, called up in a window mode, also has an active "window" which normally displays calculator memory status but displays a scrolling "HELP" message on request.

Documentation is brief but adequate. Main and sub menus are consistent and logical; error protection appears to be excellent. Clock and Alarm are set from the main menu, as are Lock, Save, and Run. Since Run will clear data it has special error traping, but all other menu options are called with a single keystroke.

Color and sound are used in a restrained but effective manner. "BIZ" screens may be output to the T/S Printer from the menu, but no mention is made of other printers.

"BIZ" is shipped with sample data on the tape, which serves as a good illustration of the features encompassed. This original tape should of course be considered the "Master", and be used primarily to prapare a "working copy"; then filed for later reference should disaster strike.

DRAW II
Copyright 1984 by Peech II Productions, 6333 Parkman Place, Cincinnati, OH 45213.

(Program may also be available from the T/S Connection, 3832 Watterson Ave., Cincinnati, OH 45227)

As the title implies, DRAW II is a program to draw pictures with. Colors utilized are user selected, and various options may be accessed via simple menus and (Watch out, MAC!) ICONS. Joystick is REQUIRED, and must be plugged into the left joystick port. Pre-drawn circle, triangle, and square may be selected from the icons in a graphics mode along with "brush width". When pre-drawn figures are utilized, the user is requested to specify size and whether the figure is to be filled or remain an outline only. Finished drawings may be SAVED and reloaded, and one drawing may be retained in memory. Screens may be output to the T/S Printer, and Mark Fendrick (Computer Shopper, March 1985) reports similar results with his Gemini 10X.

While DRAW II displays some outstanding concepts, it falls a bit short of perfection in actual performance. First, it is slow. Second, it is hard to maintain accurate positioning of the cursor in the "fine" mode. Third, and most serious, when using the pre-drawn figures one is often advised that the size selected is too large when it is quite evident that sufficient room exists in the area selected for the figure to occupy. Placing the selected figure of the selected size in the selected area COULD sometimes be accomplished by starting with a much smaller figure, then enlarging it in steps by returning to the icons and menus; a laborous and time consuming process! In addition, it was noted that certain "dead" spots existed where the cursor would not proceed. In drawing a diagonal line, the visible cursor would not go past the screen boundaries, which the actual plot position did. This made it difficult to draw a diagonal corner with the apex lying exactly on the border line.

Let me repeat that this program is built on some beautiful concepts, and I have no desire to condemn it.

I would just like to see a completely debugged version with a bit of machine code for added speed!

T/S 1000 SOFTWARE REVIEW
by Tex Faucette

PARTIAL PASCAL
Copyright 1983 by Semper Software, 585 Glenn Ellyn Place, Glenn Ellyn, IL 60137

16K RAM required, supports T/S 2040 printer.

As you read this review, please keep in mind that I am NOT a serious programmer. While I have fiddled around with FORTH and fouled up other peoples BASIC, I lack a certain patience required for serious creation. Creating software is for gifted artists, I just slap on a quick coat of paint.

PARTIAL PASCAL is at the very least an interesting creation. Since this was to be my first experience with Pascal, I turned to the only beginners text readily available to me. "GETTING STARTED IN PASCAL PROGRAMMING" by Jose Camara & Frederick Puccetti (TAB Books, Inc., ISBN 0-8306-0188-0) aided considerably and I believe that my limited experience with FORTH also helped. PARTIAL PASCAL comes with a very well written manual containing over 50 pages. The arrangement is such that the "complete editor" and "diagnostic messages" may be referred to quickly. (And I can assure you that the Pascal novice WILL refer to them frequently!) The manual is not intended as a complete Pascal tutorial, but as a guide to this particular version of the language. The manual does contain a generous number of demonstration programs which should be studied with attention to syntax; Pascal can be as "Picky" as FORTH!

Partial Pascal loads in about 5 minutes. The loading pattern sometimes resembles the patterns experienced with some of the fast-load programs. This is a normal situation, let it run!

Once loaded, the program offers one a choice of Edit, Compile, Load and Execute. Typing in ones source program is rather slow for an experienced typist as keyboard response leaves something to be desired. Source program may be SAVEd to tape (just in case of you-know-what). The next step is to compile your program, and that is where PARTIAL PASCAL begins to show its true worth. A program occupying a single screen

is compiled (literally!) in a flash if no errors are present! I timed one program containing 77 lines which was compiled in 15 seconds.

The compiled program (now referred to as "object code") may be saved to tape from whence it may be called and executed by the third menu option. The short programs I tried were executed at a satisfying speed. A program (from the volume referenced above) which was supposed to generate a 49 number "Fibonacci sequence" began displaying negative values about the 24th number. Whether this constitutes a "bug" I will leave to those more literate in Pascal. Otherwise, the execution was beautiful!

I have spent quite a few hours playing with PARTIAL PASCAL, and I have experienced a couple of crashes. One I am certain was related to the 2040 Printer, the other may have been a tape loading error. On another occasion a short program did not compile on the first try, but did on the second without any changes being made.

Despite these problems I have mentioned, and some generalities in the "Why didn't they. . . " category, I believe PARTIAL PASCAL is quite worthy of a place in the T/S Program Library. I intend to explore it further (Pascal adventure games, maybe) and hope someday to see a 2068 version! TSH

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BOOK REVIEW

BOOK: COMPUTER INTERFACING TECHNIQUES IN SCIENCE
BY: PAUL FIELD & JOHN DAVIES
FROM: SCOTT, FORESMAN & CO. - 1900 E. LAKE AVENUE, GLENVIEW, IL 60025 (312) 729-3000
PRICE: $12.95

"Computer Interfacing Techniques in Science" contains some 30 experiments for use on any ZX computer (ZX81, TS1000, 1500, Spectrum or TS2068). It is definitely not for the rank beginners to interfacing circuiting, but can serve as a good "second-book" for those who already have some circuit-building skills and wish to expand their horizons.

The book is comprised of 7 chapters and 4 Appendices, one of which is a unique, if awkward to use, cut-out and paste-up manual assembler device. The main thrust of the book is, as the title suggests, for technicians, scientists and teachers as well as hobbyists. It is clearly intended to serve as a sort of lab manual for hardware experiments.

The preface and chapter I give very general background information about computers and number systems in general. Brief mention of TS/ZX computers is made. Chapter II is a crash course in digital logic, from simple AND, OR gates up through the more complex decoders, counters and timers. It is also in Chapter II that we begin to realize that this book is definitely not for the novice.

As the authors begin to address "Hardware & Tools", and Breadboarding, we find no photographs or sketches of hardware (save one sketch of blank breadboard) or tools. A very cursory look at construction techniques is soon followed by the biggest disappointment of the book: the authors specify the purchase of the FDZX1 interface board. This means that if you want to do these experiments, you'll probably need to purchase that board. The address of the vendor, Group Technology, LTD, Box 87, Check, VA 24072, is given. You'll probably have time to order the board though, since it (and the computer as well for that matter) is not needed for the first 6 experiments. The experiments are well thought out and given just a few relatively common TTL IC's, a garden variety solderless breadboard, and some prior knowledge on the use of same, the average reader should be able to experiment with and begin to understand basic logic circuits.

In Chapter III, the system buses and their uses are discussed and a fast reference to machine code programming is given. Interestingly, to maintain compatibility in software between the TS1000 and 2000 series the author has not used the IN and OUT BASIC commands of the latter. This means you must use a USR call in either machine. The "experiments" in this chapter involve inputting machine code bytes and running short programs which illustrate the 8080 instruction set.

Chapter IV begins with a statement that there are 256 I/O ports. In fact, with extended addresses (use the BC pair) there can be over 65000 I/O ports. The authors may be simply trying not to confuse the reader at this point. Parameters for I/O ports, gating, addressing and timing are discussed and finally a schematic for the buffered interface circuit is given. Here, for the first time, you'll need your interface as well as breadboard to conduct such experiments as creating a device select pulse, setting up simple input and output ports and preparing an advanced I/O port using the 8255 P.P.I.

Finally, in Chapter V, we get to the real meat of the book. The authors at first generalize (e.g. a serial-to-parallel conversion circuit is discussed, but not realized), but soon get down to serious interfacing. The first experiment here gives the circuit and software for an effective analog joystick interface using 555 timers and simple "pot" type joystick (e.g. Radio Shack, Apple). A real time clock is built and programmed (58167) or 53167 IC - one of the few typos in the book. A "dead end" RS232 port is built. This port can only talk to itself and is thus of limited usefulness except for instructional purposes.

Analog Conversions are covered in more detail in Chapter VI. Light sensitive devices, an electronic scale, temperature measuring and control are demonstrated in these experiments. Again, a sound experimental technique is followed and the serious hobbyist or student will get much from these lab trials.

Qverall, I found "C.I.T. in S." delivered valuable instruction and information. It would serve well as a supplemental book to "Powerful Projects" (reviewed elsewhere) from the same publishers, and I'm certainly not unhappy that I purchased the book.

However, as with many such works it is seriously flawed in not delivering all that is promised. You're not told until page 28, in one sentence, that you aren't going to build your own interface. The back jacket uses phrases like "anyone", "Hands-on" and "low-cost" to describe the book. "Anyone" had better have a pretty good understanding of electronic hardware, not just electricity. The experiments are "hands on", but most novices would not be able to assemble the preliminary hardware (boards, connectors jumpers, etc.), that "hands on" portion is given sort shrift. The FD-ZX1 boards price is not discussed, but it is ot "free". Further, some of the parts mentioned are hard to come by (e.g. strain gauges).

Again, the experiments are good and while some important theories are discussed and not implemented, those that are, are done

well. Still the distant, slightly too theoretical approach of the authors and need for a commercial I/F board cause me to downrate this work to a 7 out of 10, for the novice reader. Intermediate experimentors will enjoy it more, in my opinion.
@1985 P. Donnelly TSH

BOOK REVIEW

TITLE: POWERFUL PROJECTS WITH YOUR TIMEX/SINCLAIR
BY: JIM STEPHANS
FROM: SCOTT, FORESMAN & CO. GLENVIEW, IL
PRICE: $12.95 (ISBN: 0-673-18038-7)
COVERS: INTERFACING 2068 TO OUTSIDE WORLD

"At last!", I thought, as my trembling fingers quickly flipped through the pages of "Powerful Projects with your Timex/Sinclair", "a good basic hardware/interfacing manual with real projects". I saw breadboards, pictures of wire wrap tools, on Armatron robot, a number of good looking schematics, and hardware contruction tips for several projects. Was this the ultimate 2068 interfacing book I had been looking for? Well, yes and no. Mostly yes, but there are a few parts of "PP" which put me off a bit.

Let's begin with a look at what's in "PP". Jim Stephan's book is 228 pages long, has 138 illustrations and is divided up into 7 chapters:

Chapter I covers the 2068, the Z80 instruction set and architecture, hexadecimal code and the use of IN and OUT instructions. That is a lot to cover in 36 pages; too much, in fact, but it does give you a good overview of those subjects.

In Chapter II, Stephans discusses basic electronics components, design, breadboarding, wirewrapping and the construction of a motherboard to house your projects. He gives good examples, including photographs, schematics and line drawings in his narrative. This chapter is a must for novices and a refreshing review for the experienced kit builder.

Still following a very basic approach, Chapter 3 discusses the importance of fundamental skills (like soldering) and high school "electricity theory", before moving on to the construction of your own power supply. Stephans then gives a well illustrated guide to the backplane's (PC board) edge connector and the parts you'll need to make your own interface board. As you move through the chapter, you're asked to make measurements and interpret your results. You'll build a simple and inexpensive buffered I/O port and test it as you do.

Not content with simply lighting up LED's from BASIC, Chapter 4 provides construction plans for an optoisolated, triac driven, 3 outlet port which can run 110 volt appliances.

In Chapter 5, Microbotics are introduced, and a budget model robot, of sorts, is described in enough detail that most home craftsmen could build it. Moving on from there, Chapter 6 describes such other diverse projects (using the same Buffered I/O port) as a speech synthesizer, temperature sensor and A/D converter, among others. Schematics, chips, software, sources of supply, part numbers and good line drawings are provided for all projects.

Chapter 7 is "what if" collection which wastes a couple of pages, though this is made up for, somewhat, by the TS1000/1500 conversions provided in the appendices.

I was impressed by most of what I read in "PP", though I found some errors, or omissions in a few of the chapters. These were annoying, but would probably not create any real problem, aside from a little confusion. The author's style is at once casual and parenthetical, while being forcefully reassuring. While I didn't care much for such expressions as having IC's "go to dreamland", the generally positive style can only help the novice to overcome his trepidations.

"PP" is an excellent book, for the level of interfacing (simple 8 bit I/O ports, partial decoding) which it supports, and can serve as a great first book for the novice. I rate it a 9 out of 10, though Mr. Stephans almost lost another point for "hype"; the picture of Radio Shack's "ARMATRON" was just that, a picture, with no more information than you could get from their catalog. I still can't figure out what purpose it would serve, short of snagging an unwary buyer in a book store. Still, at $12.95, it's reasonable value for money, and right now, just about the "only game in town". (We'll report on other new releases as we find them.)
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*** AS DESCRIBED IN T S HORIZONS (March 1984 through March 1985) ***

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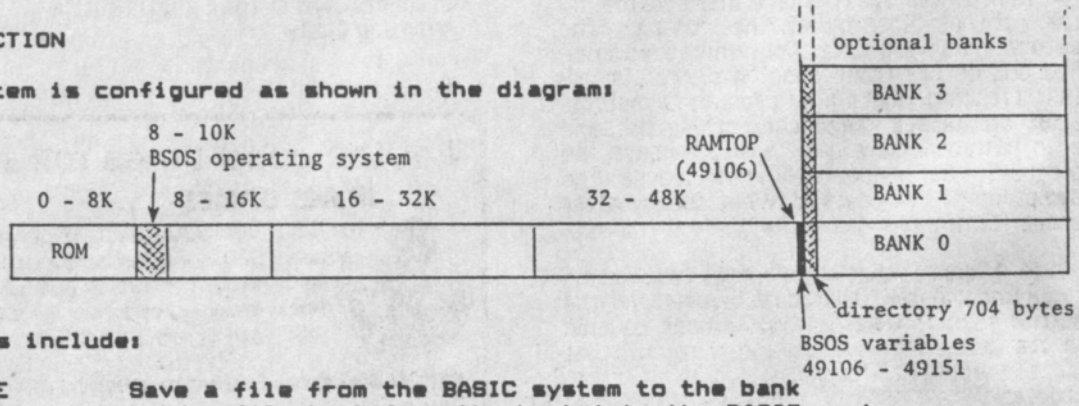
INTRODUCTION

The system is configured as shown in the diagram:



Commands include:

SAVE	Save a file from the BASIC system to the bank
LOAD	Load a file back from the bank into the BASIC system
PURGE	Purge a file from the bank
RECLAIM	Clear variables or a program (or part) from the BASIC system
PACK	Repack the contents of the bank
BANK	Change from one bank to another
ROOM	Determine space available in a bank
QUIT	Return to Sinclair BASIC system

A sample directory listing the contents of a bank is shown on the right. Some of the routines in BSOS can be called from within a BASIC program to create a virtual memory system -- so you can have a program larger than 16K or a huge data file. A virtual memory system allows the program to change while it is running.

The program on the tape will transfer the operating system to the 8-10K block; reset RAMTOP to 49106; and load a directory (and any routines already in the bank). The tape is available for $10 ppd from:

HUNTER
1630 FOREST HILLS DRIVE
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```
BANK 1 DIRECTORY
********************************
NO.   NAME     .EXT  ADDR  SIZE
---   ----     ----  ----  ----
A: DIRECTORY  .DIR:49152:00704:
B: SAVEROUTINE.PRG:49856:00134:
C: DEC-TO-HEX .PRG:49990:00308:
D: HEX-TO-DEC .PRG:50298:00134:
E: CONVERSION .PRG:50432:00750:
F:
G:
H:
I:
J:
K:
L:
M:
N:
O:
********************************
1:SAVE  3:PURGE   5:PACK  7:ROOM
2:LOAD  4:RECLAIM 6:BANK  8:QUIT
```

REVIEWS FOR THE NON-PROGRAMMER
by A. Gindin

CHROMA-SOFT from RUSSELL ELECTRONICS
More on WORD*
Replacement Ribbons

- I bought the program "Chroma-Soft" from Russell Electronics. The program loads easily and the demo is self-running. He supplies a yellow filter to go over your screen (which should be packaged in a tube to avoid creasing). The good news is that one can actually appreciate color on the black and white screen. At least I could see the blue. The red appeared a little yellow and I had trouble with the green. The documentation is very thorough and does give ways to alter the program to improve color rendition. The program also allows you to "paint" by moving the cursor. The bad news is the colors are produced by stimulation of the retina (the nerve cells at the back of the eye) by carefully controlling the rate of flashing of the screen. The author includes a CAUTION (which I wish he had put on the front page) which tells you that flashing lights may produce symptoms such as nausea, headache, confusion, and even epileptic seizures. While he says the program as received will cause no symptoms, I became somewhat queasy after about 15 minutes.

While I agree that this is a fascinating experimental tool that does everything the author says it will, I would advise caution in its use: only use it a few minutes at first. I would not incorporate it in any other program, lest some sensitive individual accidentally uses it. I would hide the program from anyone known to have epilepsy. Clearly experimental neuro-physiology/neuropsychology for the home is a new and exciting idea. Obviously one should observe appropriate care and respect when experimenting on living creatures, even people.

- An additional note on WORD* for the ZX81: The only other type style available on the Seikosha GP-100A is double width. This can be invoked by using the Insert String command of Shift 3, I, graphics 7, Shift 3, I and cancelled with graphics 8 instead of 7. Graphics 7 and 8 are the Sinclair codes for ANSI SO and SI respectively. The only problem is that this sequence throws off the line commands. When using the double wides for a heading you have to insert spaces to get the letters to align properly.

The correct number of spaces is determined by experimentation, at some cost in paper. It's even harder to insert double wides in the body of a letter . I actually gave up.

- Replacement ribbons for the Seikosha cost around $8 at the Shack: Part no. 26-1424 for the DMP-100. If you open the box on the left end of the ribbon, there is a sponge which can be reinked. Ink is availble at $3pp for 2 ounces, which should last forever, from SAS Industries, 3091 N. Bay Drive, N Bend, OR 97459-5020 in black, red, blue, green, and yellow. This seems to be cheaper than buying new ribbons but if you do a lot of printing and really want to save money, the quart size is only $24.50. You'll still probably want the small bottle to make handling easier.

TSH

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From Curry Computer

QL REPORT

This report is excerpted from QL Report #9 (Oct.)

A lot of you have had your QL now for over a month. The general consensus does seem to be that the wait was worth it. Quality control on the computer appears so far to be very good. Some of you have experienced problems with the Psion cartridges that come with the QL but this is minor. We have had calls from customers who have inadvertently put the master in the wrong drive and wiped it out during the "cloning" or copying procedure. Don't feel bad - we've done it too. Having two drives is both a blessing and a curse at times.

Most of the problems you are having you will find will disappear within the next few weeks - they are unfortunately the result of "user error" even though I can hear some of you saying, "It can't be me - it must be the @#$%* machine." The QL is an advanced machine and therefore takes more time than others to learn. The User Guide that comes with your machine is lacking in certain areas, especially on networking. The October, November, and December issues of QL User magazine are going to have a special insert of additional pages for your User Guide so be sure to get those issues. Remember by prepaying you stand a better chance of getting a copy since sometimes we are shorted and then paying customers come first.

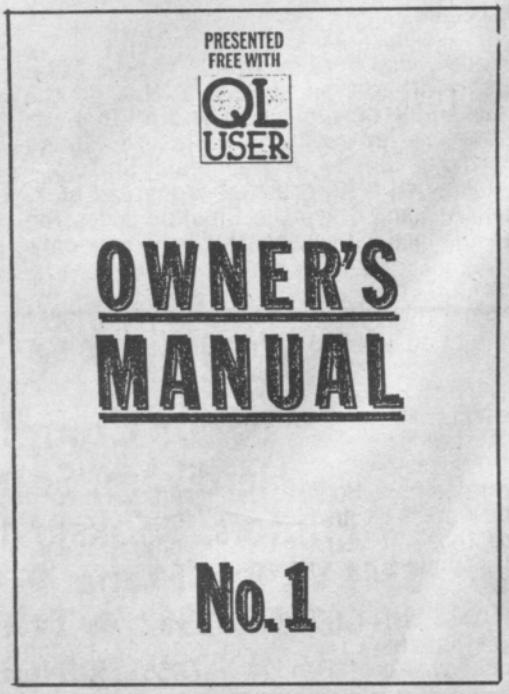
We have a lot to cover in this Report. We have been unable to adequately connect a modem to the QL as of this writing. We tested our Terminal program on an Anchor 300/1200 baud Volksmodem. We were able to sign on to MCI Mail and understand the transmission but there was a lot of "garbage" on the screen. With Terminal, one is not able to set either the stop bits or the word bits. We have sent the program back to England and hopefully the programmer can make a patch. We also have a member of the Boston Computer Society testing the software on a Hayes Smartmodem so we should get the problems solved in the near future.

Some British programs, Agenda and Qspell being two of them, will not give you a full screen if you push F2 first on your monitor. You have to push F1. We know that to control the horizontal scrolling on certain monitors it is better to hit F2 and then type in "mode 0" but for some reason even on a monitor you will not get a complete screen.

The easiest thing to do is to boot up using first F2 and if that is unacceptable then try F1. Agenda needs one line changed to run over here; the window has to be slightly re-dimensioned but then it runs fine.

Most of you have probably seen TV or magazine ads for the Atari ST or the new Commodore Amiga. All that money spent advertising machines that almost literally have no software available to run on them. The Amiga is impressive and so is the ST - but the QL is impressive and it is functional immediately. Not so with the other two 68000 machines.

Our case study concerning Archive yields some interesting information this month. We now have 795 records in our customer file. If we do not order the file by zip code before closing, we have 11902 free when we do print memory() upon opening the file. This is with disk. For some reason with



microdrive we have 10878. If we sort by zip code we go down to 4596. We have found it is better to sort a subfile after using the "select" command than to sort all of a larger file. British users tell us that files can be corrupted if you by mistake get down to below 500 bytes left for Archive to use.

If we make a subfile of, say all the QL people in our database, which is 276 (we still have lots on other databases we will put in later), and then sort by zip code, we have 8628 bytes left. So you can see the value of the select function in this instance.

One command in Archive you may have overlooked is the "position" command. Each record you enter is assigned a position numerically, starting with 0. For some reason, it is very, very fast on disk. Look at the following:

All disk times were using the CST disk interface. Using these "benchmarks" we will time the Kempston and Silicon Express disk interfaces next month. "Find position 398" means you type in, "position 398" and the file for John Doe for example, comes up on the screen. This on disk is almost instantaneous. When we use the "find" command and type in "find Doe," you can see how much longer it takes when dealing with the whole file, and how much time you save when using the command from within a subfile.

Because the position command is so fast, it might not be a bad idea to create your file with a numeric field for position. You would have to put the number in yourself but once in it would save you a lot of time. If you did a print out of the records with the position field, it would speed up retrieval immeasurably. We could print out addresses from our customer file sorted by zip or alphabetically by last name, with the position number of each file. Updating records would go much faster if we knew the position number of an existing customer.

New programs are coming out at a pretty fast clip now. We have Lattice C and APL on order. Qspell it turns out is configured for Quill and not QL-WP so we are having to have it modified - bear with us. We have Hyperdrive on order which is a very nice arcade game similar to Pole Position. It has a number of screens and you start off in 26th position and have to move up to at least 5th in a certain amount of time to be able to advance to the next screen.

Lands of Havoc is another new game which is huge. It has 2000 screens and comes with 9 full color maps. You have to visit at least 200 locations in the correct order to win. We also have Hopper, the perennial favorite, and Cutthbert in Space, a fast paced agame for those of you who like zipping around in starships collecting various items.

In the book department we have three excellent new titles. Advanced QL Machine Code by Adam Denning is 256 pages and describes everything from the finer aspects of SuperBasic to the peripheral expansion capabilities of the QL. Particular attention is given to QDOS, giving details to all traps and calls. Programs and diagrams show how the QL can be used as a terminal for other machines, and how it can be interfaced to all sorts of interesting devices.

Understanding the 68000 by Leon Heller is designed to familiarize the reader with the main hardware and software features of the Motorola 16/32 bit microprocessor and the reduced bus 68008, used in the QL. Leon is chairman of IQLUG, the Independent QL Users Group in England and is very knowledgeable on 68000 machines. The best thing about this book is that he shows you how to make a simple machine language monitor, using a subset of the available instructions. 108 pages.

Our other new book is called Quantum Theory by Jeremy San, Fouad Katan, and Simon Rockman. This is a beginners text which some of you will find useful and is a welcome supplement to the QL User Guide. Everything from graphics to sound is covered. There is even a short chapter entitled, "Care of Your QL." 187 pages.

We also want to mention that besides QL User, we also stock every month two other magazines that are devoting more and more space to the QL. One is Sinclair User which deals with every Sinclair machine from the QL to the ZX81, and the other is Electronics and Computing which is a computer projects magazine. The September issue, of which we still have a few in stock, deals with modems on the QL and has an article on problems with the Atari ST by none other than Adam Denning. According to Denning, GEM is not ready yet and it was impossible to run a few simple benchmarks in C on the machine.

We have coming as evaluation units two new pieces of hardware. One is a disk plus 128K RAM plus Centronics interface combination, all in one package that does not need external power. The other is a disk plus 256K RAM combination that also does not require external power. Both of these units plug into the expansion port on the left side of the QL. We hope to give you more information by the next Report.

The QL has a standard, more or less, ASCII character set that ends at code number 127. However, the QL also has an extra character set with code numbers between 128 and 190. To see these characters type in this small program:

```
10 For x = 128 to 190
20 PRINT x, chr$(x)
30 NEXT x
```

Most are accessed by using "control" and "shift" together with another key. For example, char$ 170 is printed using "control" and "shift" and the "k" key. Try it out. TSH

T-S NEWS

SOFTAID
Feed The World

ITEM: SOFTAID is a cassette tape containing several popular Spectrum programs (including Ant Attack, Horace Goes Skiing, 3D Tank Duel, and eight more.) Proceeds from the sale of this tape go to Bob Geldof BandAid Ethiopian Appeal Fund. It is available from Curry Computer for $9.95 , and from other dealers.

ITEM: Attention all ham radio operators.
For a catalog of T/H ham programs, write to Kraig D. Pritts-KA2LHO, 3421 Oneida St, Chadwick NY 13319. Some of the programs include "Sunrise, Sunset," antenna design, county hunting programs, electronics programs and more> Most are available for both the TS 1000 and 2068. TS 2068 programs are also available on A&J Microdrive wafers.

ITEM: New Publications
A couple of new "specialty" publications have become available for Timex users.

- MEMONOTES is publication of the Syncware Group. It is quarterly journal for users of Memotext and Memocalc, two great for the TS 1000 series of computers. Memotech originally published these program on EPROM, but now they are available in a variety of forms. Subscriptions are $13.95 from Thomas B. Woods, P.O.Box 64, Jefferson NH 03583.

For information on the availability of various versions of these programs, write to Fred Nachbaur, Compartment 12, Mountain Station Group Box, Nelson B.C., Canada V1L 5P1.

-WAFADRIVE ENGINEERING BULLETIN is put out by Damco Enterprises. The first bulletin contains some updates for Spectral Writer, information on transferring Spectrum programs to wafer tape (i.e., Vu-Calc, Vu-File, Masterfile); printer software; etc. For all Wafadrive users. Damco, 67 Bradley Ct.,Fall River MA 02720.

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Ad Index

Audiovision	19,30
Cole	12
Computer Trader	23
Curry Computer	20,27
Damco	7
Knighted	32
Loxterkamp	15
Russell Electronics	27
RW Software	15
Simulsion	23
S.U.M.	15
Sunset	31
Time Design	23
21st Century	2, 23
Zebra	5,16,17

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